

(c) *Criteria for the use and care of positioning device systems.* (1) Positioning device systems shall be inspected before each use for mildew, wear, damage, and other deterioration. Defective components shall be removed from service.

(2) A positioning device system or component subjected to impact loading shall be immediately removed from service and shall not be used again for employee protection, unless inspected and determined by a qualified person to be undamaged and suitable for reuse.

(d) *Training.* Before using a positioning device system, employees shall be trained in the application limits, proper hook-up, anchoring and tie-off techniques, methods of use, inspection, and storage of positioning device systems.

[61 FR 26352, May 24, 1996, as amended at 67 FR 44544, July 3, 2002]

#### APPENDIX A TO SUBPART I OF PART 1915—NON-MANDATORY GUIDELINES FOR HAZARD ASSESSMENT, PERSONAL PROTECTIVE EQUIPMENT (PPE) SELECTION, AND PPE TRAINING PROGRAM

This appendix is intended to provide compliance assistance for hazard assessment, selection of personal protective equipment (PPE) and PPE training. It neither adds to or detracts from the employer's responsibility to comply with the provisions of this subpart.

1. Controlling hazards. Employers and employees should not rely exclusively on PPE for protection from hazards. PPE should be used, where appropriate, in conjunction with engineering controls, guards, and safe work practices and procedures.

2. Assessment and selection. Employers need to consider certain general guidelines for assessing the hazardous situations that are likely to arise under foreseeable work activity conditions and to match employee PPE to the identified hazards. The employer should designate a safety officer or some other qualified person to exercise common sense and appropriate expertise to assess work activity hazards and select PPE.

3. Assessment guidelines. In order to assess the need for PPE the following steps should be taken:

a. Survey. Conduct a walk-through survey of the area in question to identify sources of hazards.

Categories for Consideration:

- (1) Impact
- (2) Penetration

- (3) Compression (roll-over)
- (4) Chemical
- (5) Heat
- (6) Harmful dust
- (7) Light (optical) radiation
- (8) Drowning
- (9) Falling

b. *Sources.* During the walk-through survey the safety officer should observe:

(1) Sources of motion; for example, machinery or processes where any movement of tools, machine elements or particles could exist, or movement of personnel that could result in collision with stationary objects.

(2) Sources of high temperatures that could result in burns, eye injury or ignition of protective equipment.

(3) Types of chemical exposures.

(4) Sources of harmful dust.

(5) Sources of light radiation, for instance, welding, brazing, cutting, heat treating, furnaces, and high intensity lights.

(6) Sources of falling objects or potential for dropping objects.

(7) Sources of sharp objects which might pierce or cut the hands.

(8) Sources of rolling or pinching objects which could crush the feet.

(9) Layout of work place and location of co-workers.

(10) Any electrical hazards.

(11) Review injury/accident data to help identify problem areas.

*Organize data.* Following the walk-through survey, it is necessary to organize the data and other information obtained. That material provides the basis for hazard assessment that enables the employer to select the appropriate PPE.

d. *Analyze data.* Having gathered and organized data regarding a particular occupation, employers need to estimate the potential for injuries. Each of the identified hazards (see paragraph 3.a.) should be reviewed and classified as to its type, the level of risk, and the seriousness of any potential injury. Where it is foreseeable that an employee could be exposed to several hazards simultaneously, the consequences of such exposure should be considered.

4. *Selection guidelines.* After completion of the procedures in paragraph 3, the general procedure for selection of protective equipment is to:

(a) become familiar with the potential hazards and the types of protective equipment that are available, and what they can do; for example, splash protection, and impact protection;

(b) compare the hazards associated with the environment; for instance, impact velocities, masses, projectile shapes, radiation intensities, with the capabilities of the available protective equipment;

(c) select the protective equipment which ensures a level of protection greater than the

minimum required to protect employees from the hazards; and

(d) fit the user with the protective device and give instructions on care and use of the PPE. It is very important that users be made aware of all warning labels and limitations of their PPE.

5. *Fitting the device.* Careful consideration must be given to comfort and fit. The employee will be most likely to wear the protective device if it fits comfortably. PPE that does not fit properly may not provide the necessary protection, and may create other problems for wearers. Generally, protective devices are available in a variety of sizes and choices. Therefore employers should be careful to select the appropriate sized PPE.

6. *Devices with adjustable features.* (a) Adjustments should be made on an individual basis so the wearer will have a comfortable fit that maintains the protective device in the proper position. Particular care should be taken in fitting devices for eye protection against dust and chemical splash to ensure that the seal is appropriate for the face.

(b) In addition, proper fitting of hard hats is important to ensure that the hard hat will not fall off during work operations. In some cases a chin strap may be necessary to keep the hard hat on an employee's head. (Chin straps should break at a reasonably low force to prevent a strangulation hazard). Where

manufacturer's instructions are available, they should be followed carefully.

7. *Reassessment of hazards.* Compliance with the hazard assessment requirements of §1915.152(b) will involve the reassessment of work activities where changing circumstances make it necessary. a. The employer should have a safety officer or other qualified person reassess the hazards of the work activity area as necessary. This reassessment should take into account changes in the workplace or work practices, such as those associated with the installation of new equipment, and the lessons learned from reviewing accident records, and a reevaluation performed to determine the suitability of PPE selected for use.

8. *Selection chart guidelines for eye and face protection.* Examples of occupations for which eye protection should be routinely considered are carpenters, engineers, copper-smiths, instrument technicians, insulators, electricians, machinists, mobile equipment mechanics and repairers, plumbers and ship fitters, sheet metal workers and tinsmiths, grinding equipment operators, machine operators, welders, boiler workers, painters, laborers, grit blasters, ship fitters and burners. This is not a complete list of occupations that require the use of eye protection. The following chart provides general guidance for the proper selection of eye and face protection to protect against hazards associated with the listed hazard "source" operations.

EYE AND FACE PROTECTION SELECTION CHART

| Source   | Assessment of hazard  | Protection  |
|--|---|---|
| Impact:<br>Chipping, grinding machining, masonry work, woodworking, sawing, drilling, chiseling, powered fastening, riveting, and sanding. | Flying fragments, objects, large chips, particles, sand, dirt, etc. | Spectacles with side protection, goggles, face shields. See notes (1), (3), (5), (6), (10). For severe exposure, use face shield. |
| Heat:<br>Furnace operations, pouring, casting, hot dipping, and welding.   | Hot sparks .....  | Face shields, goggles, spectacles with side protection. For severe exposure use face shield. See notes (1), (2), (3).             |
|  | Splash from molten metals.  | Face shields worn over goggles. See notes (1), (2), (3).  |
|  | High temperature exposure.  | Screen face shields, reflective face shields. See notes (1), (2), (3).  |
| Chemicals:<br>Acid and chemicals handling, degreasing, plating.  | Splash .....  | Goggles, eyecup and cover types. For severe exposure, use face shield. See notes (3), (11).                                       |
|  | Irritating mists .....  | Special-purpose goggles.  |
| Dust:<br>Woodworking, buffing, general dusty conditions.   | Nuisance dust .....   | Goggles, eyecup and cover types. See note (8).  |
| Light and/or Radiation:<br>Welding: Electric arc .....   | Optical radiation .....   | Welding helmets or welding shields. Typical shades: 10–14. See notes (9), (12).   |
|  | Welding: Gas .....  | Welding goggles or welding face shield. Typical shades: gas welding 4–8, cutting 3–6, brazing 3–4. See note (9).                  |
|  | Cutting, Torch brazing, Torch soldering .....                       | Spectacles or welding face-shield. Typical shades, 1.5–3. See notes (3), (9).   |
|  | Glare .....   | Spectacles with shaded or special-purpose lenses, as suitable. See notes (9), (10).   |

NOTES TO EYE AND FACE PROTECTION  
SELECTION CHART

(a) Care should be taken to recognize the possibility of multiple and simultaneous exposure to a variety of hazards. Adequate protection against the highest level of each of the hazards should be provided. Protective devices do not provide unlimited protection.

(b) Operations involving heat may also involve light radiation. As required by the standard, protection from both hazards must be provided.

(c) Face shields should only be worn over primary eye protection (spectacles or goggles).

(d) As required by the standard, filter lenses must meet the requirements for shade designations in §1915.153(a)(4). Tinted and shaded lenses are not filter lenses unless they are marked or identified as such.

(e) As required by the standard, persons whose vision requires the use of prescription (Rx) lenses must wear either protective devices fitted with prescription (Rx) lenses or protective devices designed to be worn over regular prescription (Rx) eye wear.

(f) Wearers of contact lenses must also wear appropriate eye and face protection devices in a hazardous environment. It should be recognized that dusty and/or chemical environments may represent an additional hazard to contact lens wearers.

(g) Caution should be exercised in the use of metal frame protective devices in electrical hazard areas.

(h) Atmospheric conditions and the restricted ventilation of the protector can cause lenses to fog. Frequent cleansing may be necessary.

(i) Welding helmets or face shields should be used only over primary eye protection (spectacles or goggles).

(j) Non-side shield spectacles are available for frontal protection only, but are not acceptable eye protection for the sources and operations listed for "impact."

(k) Ventilation should be adequate, but well protected from splash entry. Eye and face protection should be designed and used so that it provides both adequate ventilation and protects the wearer from splash entry.

(l) Protection from light radiation is directly related to filter lens density. See note (d). Select the darkest shade that allows task performance.

9. *Selection guidelines for head protection.* (a) Hard hats are designed to provide protection from impact and penetration hazards caused by falling objects. Head protection is also available which provides protection from electric shock and burn. When selecting head protection, knowledge of potential electrical hazards is important. Class A helmets, in addition to impact and penetration resistance, provide electrical protection from low-voltage conductors. (They are proof tested to

2,200 volts.) Class B helmets, in addition to impact and penetration resistance, provide electrical protection from high-voltage conductors. (They are proof tested to 20,000 volts.) Class C helmets provide impact and penetration resistance. (They are usually made of aluminum, which conducts electricity and should not be used around electrical hazards.)

(b) Where falling object hazards are present, head protection must be worn. Some examples of exposure include: working below other workers who are using tools and materials which could fall; working around or under conveyor belts which are carrying parts or materials; working below machinery or processes which might cause material or objects to fall; and working on exposed energized conductors.

(c) Examples of occupations for which head protection should be considered are: carpenters, electricians, machinists, boiler-makers, erectors, plumbers, coppersmiths, ship fitters, welders, laborers and material handlers.

10. *Selection guidelines for foot protection.* (a) Safety shoes and boots must meet ANSI Z41–1991 and provide impact and compression protection to the foot. Where necessary, safety shoes can be obtained which provide puncture protection. In some work situations, metatarsal (top of foot) protection should be provided, and in some other special situations, electrical conductive or insulating safety shoes would be appropriate.

(b) Safety shoes or boots with impact protection would be required for carrying or handling materials such as packages, objects, parts or heavy tools, which could be dropped, and for other activities where objects might fall onto the feet. Safety shoes or boots with compression protection would be required for work activities involving skid trucks (manual material handling carts) around bulk rolls (such as paper rolls) and around heavy pipes, all of which could potentially roll over an employees' feet. Safety shoes or boots with puncture protection would be required where sharp objects such as nails, wire, tacks, screws, large staples, scrap metal etc., could be stepped on by employees, causing an injury.

(c) Some occupations (not a complete list) for which foot protection should be routinely considered are: shipping and receiving clerks, stock clerks, carpenters, electricians, machinists, boiler makers, plumbers, copper smiths, pipe fitters, ship fitters, burners, chippers and grinders, erectors, press operators, welders, laborers, and material handlers.

11. *Selection guidelines for hand protection.* (a) Gloves are often relied upon to prevent cuts, abrasions, burns, and skin contact with chemicals that are capable of causing local or systemic effects following dermal exposure. OSHA is unaware of any gloves that

provide protection against all potential hand hazards, and commonly available glove materials provide only limited protection against many chemicals. Therefore, it is important to select the most appropriate glove for a particular application and to determine how long it can be worn, and whether it can be reused.

(b) It is also important to know the performance characteristics of gloves relative to the specific hazard anticipated, e.g., chemical hazards, cut hazards, and flame hazards. These performance characteristics should be assessed by using standard test procedures. Before purchasing gloves, the employer should request documentation from the manufacturer that the gloves meet the appropriate test standard(s) for the hazard(s) anticipated.

(c) other general factors to be considered for glove selection are:

(A) As long as the performance characteristics are acceptable, in certain circumstances, it may be more cost effective to regularly change cheaper gloves than to reuse more expensive types; and,

(B) The work activities of the employee should be studied to determine the degree of dexterity required, the duration, frequency, and degree of exposure to the hazard, and the physical stresses that will be applied.

(d) With respect to selection of gloves for protection against chemical hazards:

(A) The toxic properties of the chemical(s) must be determined; in particular, the ability of the chemical to cause local effects on the skin or to pass through the skin and cause systemic effects or both;

(B) Generally, any "chemical resistant" glove can be used for dry powders;

(C) For mixtures and formulated products (unless specific test data are available), a glove should be selected on the basis of the chemical component with the shortest breakthrough time, since it is possible for solvents to carry active ingredients through polymeric materials; and,

(D) Employees must be able to remove the gloves in such a manner as to prevent skin contamination.

12. *Cleaning and maintenance.* (a) It is important that all PPE be kept clean and be properly maintained. Cleaning is particularly important for eye and face protection where dirty or fogged lenses could impair vision.

(b) For the purposes of compliance, PPE should be inspected, cleaned, and maintained at regular intervals so that the PPE provides the requisite protection.

(c) It is important to ensure that contaminated PPE which cannot be decontaminated is disposed of in a manner that protects employees from exposure to hazards.

13. *Examples of work activities, trades and selection of basic PPE.*

*Example 1: Welder.* Based on an assessment of the work activity area hazards to which welders are exposed, the equipment listed below is the basic PPE required for this occupation. This does not take into account a job location in which additional PPE may be required, such as where the welder works from an elevated platform without guard rails. In this situation the welder must also wear the proper fall protection equipment, such as a body harness.

- Hard hat
- Welding Shield (Face)
- Welding Gloves
- Safety Glasses
- Safety Shoes
- Welding Sleeves (welding in the overhead position)

(Signed and dated)

*Example 2: Yard Maintenance Worker.* Based on an assessment of the workplace hazards to which shipyard maintenance workers are exposed, the equipment listed below is the basic PPE required for this occupation. Where maintenance workers are exposed to other hazards, such as asbestos, the insulation on a pipe is being repaired, maintenance workers must be provided with the appropriate supplemental PPE (requirements for asbestos PPE are set out in 1915.1001).

- Hard Hat
- Safety Glasses
- Work Gloves
- Safety Shoes

(Signed and Dated)

*Example 3: Chipper and Grinder Worker.* Based on an assessment of the workplace hazards to which shipyard chipper and grinder workers are exposed, the equipment listed below is the basic PPE required for this occupation. Where workers are exposed to other hazards, such as hazardous dust from chipping or grinding operations, chipper and grinder workers must be provided with the appropriate supplemental PPE.

- Safety Glasses
- Transparent Face Shields
- Hearing Protection
- Foot Protection
- Gloves

(Signed and Dated)

*Example 4: Painter.* Based on an assessment of the workplace hazards to which shipyard painters are exposed, the equipment listed below is the basic PPE required for this occupation. Where painters are exposed to other hazards, such as a fall from an elevation where no guardrails are present, painters must be provided with the appropriate supplemental PPE.

- Hard Hats
- Safety Glasses
- Disposable Clothing
- Gloves
- Respiratory Protection, including Airline Respirators when working in Confined Spaces

—Barrier Creams  
(Signed and Dated)

*Example 5: Tank Cleaner.* Tank cleaning operations and the basic PPE required for them depend largely upon the type of cargo shipped in the tank. Therefore, the following example is given for a tank in which gasoline has been shipped. Based on an assessment of the workplace hazards to which shipyard tank cleaners are exposed, specifically benzene and flammability hazards, the equipment listed below is the basic PPE required for this situation. Other tank cleaning operations will require variations in the PPE listed below.

—Respiratory Protection, Airline Respirators for working in confined spaces or where personal exposure limits could be exceeded.  
—Chemically resistant clothing  
—Face Shields  
—Chemically resistant boots  
—Chemically resistant gloves  
—Fall Protection  
—Non sparking tools and equipment  
—Explosion-proof Lighting  
(Signed and Dated)

[47 FR 16986, Apr. 20, 1982, as amended at 67 FR 44544, July 3, 2002]

#### APPENDIX B TO SUBPART I OF PART 1915—GENERAL TESTING CONDITIONS AND ADDITIONAL GUIDELINES FOR PERSONAL FALL PROTECTION SYSTEMS (NON-MANDATORY)

1. *Personal fall arrest systems—(a) General test conditions.* (1) Lifelines, lanyards, and deceleration devices should be attached to an anchorage and connected to the body-belt or body harness in the same manner as they would be when used to protect employees, except that lanyards should be tested only when connected directly to the anchorage, and not when connected to a lifeline.

(2) The anchorage should be rigid, and should not have a deflection greater than .04 inches (1 cm) when a force of 2,250 pounds (10.01 Kn) is applied.

(3) The frequency response of the load measuring instrumentation should be 100 Hz.

(4) The test weight used in the strength and force tests should be a rigid, metal cylindrical or torso-shaped object with a girth of 38 inches plus or minus 4 inches (96.5 cm plus or minus 10.16 cm).

(5) The lanyard or lifeline used to create the free fall distance should be the one supplied with the system, or in its absence, the least elastic lanyard or lifeline available to be used by the employee with the system.

(6) The test weight for each test should be hoisted to the required level and should be quickly released without having any appreciable motion imparted to it.

(7) The system's performance should be evaluated, taking into account the range of environmental conditions for which it is designed to be used.

(8) Following the test, the system need not be capable of further operation.

(b) *Strength test.* (1) During the testing of all systems, a test weight of 300 pounds plus or minus 5 pounds (136.08 kg plus or minus 2.27 kg) should be used. (See paragraph (a)(4) above.)

(2) The test consists of dropping the test weight once. A new unused system should be used for each test.

(3) For lanyard systems, the lanyard length should be 6 feet plus or minus 2 inches (1.83 m plus or minus 5.08 cm) as measured from the fixed anchorage to the attachment on the body belt or harness.

(4) For rope-grab-type deceleration systems, the length of the lifeline above the center line of the grabbing mechanism to the lifeline's anchorage point should not exceed 2 feet (0.61 m).

(5) For lanyard systems, for systems with deceleration devices which do not automatically limit free fall distance to 2 feet (0.61 m) or less, and for systems with deceleration devices which have a connection distance in excess of 1 foot (0.31 m) (measured between the centerline of the lifeline and the attachment point to the body belt or harness), the test weight should be rigged to free fall a distance of 7.5 feet (2.29 m) from a point that is 1.5 feet (45.72 cm) above the anchorage point, to its hanging location (6 feet (1.83 m) below the anchorage). The test weight should fall without interference, obstruction, or hitting the floor or the ground during the test. In some cases, a non-elastic wire lanyard of sufficient length may need to be added to the system (for test purposes) to create the necessary free fall distance.

(6) For deceleration device systems with integral lifelines or lanyards which automatically limit free fall distance to 2 feet (0.61 m) or less, the test weight should be rigged to free fall a distance of four feet (1.22 m).

(7) Any weight which detaches from the belt or harness should constitute failure for the strength test.

(c) *Force test general.* The test consists of dropping the respective test weight once. A new, unused system should be used for each test.

(1) For lanyard systems. (i) A test weight of 220 pounds plus or minus three pounds (99.79 kg plus or minus 1.36 kg) should be used (see paragraph (a)(4) above).

(ii) Lanyard length should be 6 feet plus or minus 2 inches (1.83 m plus or minus 5.08 cm) as measured from the fixed anchorage to the attachment on the body belt or body harness.

(iii) The test weight should fall free from the anchorage level to its handling location